

ORIGINAL RESEARCH

Opioid Dose Reductions by Sex and Race in a Cohort of Patients in a Family Medicine Clinic

Mechelle Sanders, PhD, Kevin Fiscella, MD, MPH, Mathew Devine, DO, Jefferson Hunter, BS, Yasin Mohamed, BS, and Colleen T. Fogarty, MD, MS

Background: The 2022 Centers for Disease Control’s “Clinical Practice Guidelines for Prescribing Opioids for Pain in United States” called for attention and action toward reducing disparities in untreated and undertreated pain among Black and Latino patients. There is growing evidence for controlled substance safety committees (CSSC) to change prescribing culture, but few have been examined through the lens of health equity. We examined the impact of a primary care CSSC on opioid prescribing, including by patients’ race and sex.

Methods: We conducted a retrospective cohort study. Our primary outcome was a change in prescribed morphine milligram equivalents (MME) at baseline (2017) and follow-up (2021). We compared the differences in MME by race and sex. We also examined potential intersectional disparities. We used paired *t* test to compare changes in mean MME’s and logistic regression to determine associations between patient characteristics and MME changes.

Results: Our cohort included 93 patients. The mean opioid dose decreased from nearly 200 MME to 136.1 MME, $P < .0001$. Thirty percent of patients had their dose reduced to under 90 MME by follow-up. The reduction rates by race or sex alone were not statistically significant. There was evidence of intersectional disparities at baseline. Black women were prescribed 88.5 fewer MME’s at baseline compared with their White men counterparts, $P = .04$.

Discussion: Our findings add to the previously documented success of CSSCs in reducing opioid doses for chronic nonmalignant pain to safer levels. We highlight an opportunity for primary care based CSSCs to lead the efforts to identify and address chronic pain management inequities. (J Am Board Fam Med 2024;00:000–000.)

Keywords: Family Medicine, Gender, Health Equity, Intersectionality, Logistic Regression, Opioids, Pain Management, Patient Care Team, Physician’s Practice Patterns, Race, Registries, Retrospective Studies, Substance Use Disorders

Introduction

In 2016, the Centers for Disease and Control and Prevention (CDC) released guidelines for safer

opioid prescribing for patients with nonmalignant chronic pain¹ with a goal to reduce the risks associated with chronic opioid therapy, including opioid use disorder, overdose, and death.¹ The guidelines advised: a) prescribing opioids in the lowest dose possible, b) frequent clinical assessment of risks and benefits when opioid dosages exceed 50 morphine milligram equivalents (MME)/day, and c) avoid prescribing or carefully justify dosages over 90 MME/day.

Many practices adopted the guidelines and incorporated interdisciplinary committees to review patient care and provide recommendations to primary care clinicians (PCCs).^{2–5} Although literature quantifying benefits and outcomes of such committees are sparse, some studies demonstrate guideline acceptance by clinicians and overall lower prescribed opioid doses for patients. Adawallah et al

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From the University of Rochester, Department of Family Medicine Family Medicine Research Rochester, NY (MS, KF, CF); Rochester Regional Health, Unity Faculty Partners, Rochester, NY (MD); University of Rochester Medical Center, Rochester, NY (JH, YM).

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Corresponding author: Mechelle Sanders, PhD, University of Rochester, Department of Family Medicine, Family Medicine Research Programs, 1381 South Avenue, Rochester, NY 14620 (E-mail: Mechelle_sanders@urmc.rochester.edu).

found a significant decrease in the average opioid dose (-66.6 MMEs) in a cohort of primary care patients reviewed by a safe prescribing committee during a 4-year period, $P < 0.001$.⁵

Despite emerging evidence on the efficacy of the committees to promote safer opioid dosing, the literature lacks findings through the lens of health equity and disparities. Research has documented sex and racial differences in chronic pain management; Black patients across multiple clinical scenarios, including emergency, surgical, and primary care settings, are treated and evaluated for pain less frequently, resulting from structural and/or individual racism.⁶⁻⁹ Implementing opioid safety committees may inadvertently exacerbate existing disparities in dosages and access. Our study aimed to determine the impact of a primary care based CSSC on opioid prescribing, including by patients' race and sex. We operationalized the race and sex variables as unmeasured proxies for exposure to racism and sexism.

Methods

Background

In 2017, our Family Medicine (FM) residency training practice in western New York initiated a CSSC, a multidisciplinary group to advise clinicians and increase concordance with the 2016 CDC guidelines prescribing opioids for nonmalignant chronic pain. The team included Family Medicine residents, nurse practitioners, and attending physicians in addition to behavioral health clinicians, a care coordinator, data analyst, and a clinical pharmacist. The CSSC met monthly to review and discuss patients with chronic pain managed with opioids. After discussion, the team provided a written summary of recommendations to the prescribing clinician to aid in aligning their treatment with new CDC guidelines.

In addition to the committee's case review, the practice adopted the following clinical policies for patients prescribed an opioid, patients should: 1) receive, review and agree to a controlled medications agreement; 2) receive a prescription for naloxone and have a trusted person be trained in its use; and 3) agree to undergo periodic urine testing for controlled medications. Patients prescribed ≥ 90 daily MMEs were required to attend an evaluation with a credentialed alcoholism and substance abuse counselor (CASAC) to assess for substance use

disorders. The practice developed a patient registry that provided each clinician with a summary of the patients on their panel and the total opioid dose prescribed and the adherence of the clinician to the above interventions. The associate medical director, who led the CSSC, provided feedback to clinicians with patients who had potentially unsafe opioid prescriptions.

Setting and Sample

We conducted a retrospective cohort study of patients listed on CSSC registry. The registry included all patients in the practice prescribed a controlled medication. Our study's cohort included: adult (≥ 18 years) patients with nonmalignant chronic pain prescribed a controlled medication ≥ 90 MMEs for ≥ 90 days and included all patients with a visit in fiscal year 2017 (baseline) and at least 1 subsequent visit in 2021 (follow-up). We chose the 4-year period to account for the time needed to safely taper controlled substances among patient who entered the cohort at different times. Controlled medications included opioids, stimulants, sedative-hypnotics, and pregabalin. For this analysis, we focused on opioid analgesics, measured in Morphine Milligram Equivalents (MME) to allow standardized comparison.

In 2017, our practice initiated a CSSC. The goal of the CSSC was to align with the 2016 CDC guidelines related to prescribing opioids for nonmalignant chronic pain. It was composed of a multidisciplinary group of medical and behavioral health clinicians, care coordinators and medical residents. They convened monthly for 50 minutes to discuss specific patient cases that involved potentially unsafe opioid prescriptions (≥ 90 MMEs). After discussion, the CSSC provided a written summary of their recommendations to the prescribing clinician.

Measures

The practice's data coordinator abstracted anonymized CSSC data from the electronic medical record (EMR).

Patient Characteristics

Patient characteristics available from the electronic health record included age, sex at birth (male, female) and race (Black, White and unknown) derived from the electronic health record, which are presumably but not necessarily self-reported.

Dose Reduction

Our primary outcome measure was a change in MME dose from baseline to follow-up; we converted all doses of opioids to standard MME's using a standard conversion factor¹⁰.

Dosing Disparities

We stratified our sample into 4 subgroups by sex (male vs female) and race (White vs non-White) to examine potential evidence of disparities in dose changes. We compared the differences in dose changes between the subgroups at baseline and follow-up.

We also examined potential intersectional disparities. An intersectional lens recognizes that social categories are mutual and the experience of 1 social category (eg, race) may differ across other categories (eg, sex).¹¹ Therefore, we described the joint disparity as the difference in MMEs at baseline and follow-up between those dually marginalized (Black women) to those that do not belong to either marginalized group (White males).¹²

Analyses

We performed descriptive and bivariate analyses to determine differences in dosing at baseline and follow-up. We summarized the data using frequencies and proportions, and numeric measurements with means and standard deviations. We used paired *t* test to compare changes in mean dose from baseline to follow-up among subgroups. We used logistic regression to determine if patient characteristics were associated with being prescribed a dose of <90 MME at follow-up. *P* values of <0.05 were considered statistically significant. We performed all analyses using Stata 12.0 (College Station, TX).

The University of Rochester's Institutional Review Board approved the study.

Results

There were 93 patients in our cohort. Table 1 shows the demographics of the cohort. Most patients were White, female and had 6 visits with a primary care clinician during the study period.

The mean opioid dose in the cohort decreased from nearly 200 MME at baseline to 136.1 MME at follow-up, Table 2. Thirty percent of patients had had opioid dosing reduced to under 90 MME by follow-up. Ninety-five percent had a dose change. Seventy-eight patients (84%) had a

Table 1. Cohort Characteristics 2017–2021

(n = 93)	Mean/Proportion	Range
Age (years)	59	34 to 79
# Visits (n)	6	1 to 20
Race (%)	N	(%)
Black	34	37
Other/unknown	4	4
White	55	59
Sex (%)	N	(%)
Female	55	59
Male	38	41

Table 2. Changes in MMEs from 2017–2021

	Mean (mg)	95% CI	<i>P</i> -Value
2017 MME	199.4	15 to 848	
2021 MME	136.1	16 to 818	
Difference in MME overall	−63.3	−362 to 360	<i>P</i> < .0001
Difference in MME w/dose drop	−82.9	−362 to −1	<i>P</i> < .0001

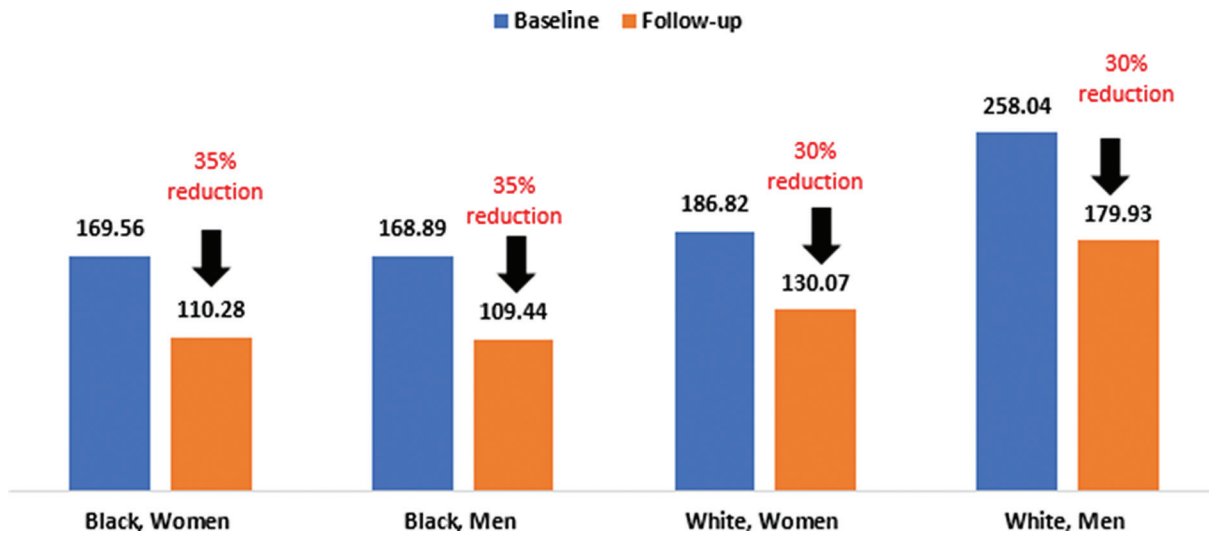
Abbreviations: MME, Morphine milligram equivalent; CI, confidence interval.

decrease in dose, (n = 7, 8%) had an increase and (n = 8, 9%) had no change. The mean decrease and increase in MMEs were −82.9 and 83.7, respectively. Patient demographics were not statistically significant predictors of being prescribed <90 MME at follow-up.

At baseline, White men were prescribed higher doses than other groups at baseline (258 MME) and experienced the greatest absolute dose reduction, a mean reduction of 78.1 MME, Figure 1 Black men and women had a 5% higher rate of reduction compared with White men and women, but the reduction rates by race or sex were not statistically significant.

Table 3 depicts the comparison in mean dose by race and sex subgroups at baseline and follow-up. At baseline, Black women were prescribed on average 88.5 MME's fewer compared with their White men counterparts; this number represents the joint disparity based on race and sex, *P* = .04. At the follow up period, the joint disparity was reduced to 69.65 at follow-up and was no longer statistically significant.

Figure 1. This graph shows the changes in morphine milligram equivalents (MME) dose in 2017 and 2021 by sex and race. All groups had dose reductions ranging from 30% to 35%. The greatest reductions were among Black men and women.



Discussion

Our findings add to the previously documented success of CSSCs in reducing opioid doses for chronic nonmalignant pain to safer levels.^{13,14} A 30% reduction in dose has been reported as clinically significant.¹⁵ The overall mean opioid dose in this study was reduced by 28%, to 136 MMEs. At baseline, White men were prescribed the highest mean dose whereas Black women were prescribed the lowest mean dose. The joint disparity for Black women was statistically significant at baseline, but not at follow-up. Absolute dose reductions were highest for White

men and relative dose reductions were greater for Black patients in general. However, these findings were not statistically significant. Previous studies have shown that White patients were more likely to receive high dose opioids for pain than patients who are Black, Latinx, or Asian.¹⁶⁻¹⁸ Women receive lower MME for noncancer pain and self-administer fewer MME based on patient controlled analgesia devices.¹⁹ The extent to which these differences reflect implicit gender bias, gender roles, differences in opioid receptors or hormonal differences remains is not clear.²⁰⁻²²

Table 3. Single Group and Intersectional Disparities

	Baseline MMEs (Mean, Std)	p-Value	Follow-up MMEs	p-Value
Race				
Black (n = 34)	169.38, 94.05	0.07	110.06, 80.43	0.06
White (n = 59)	216.74, 167.19		151.17, 141.80	
Sex				
Women (n = 55)	178.55, 96.08	0.05	120.94, 85.15	0.08
Men (n = 38)	229.66, 194.82		158.11, 163.87	
Joint Disparity				
Black Women (n = 25)	169.56, 100.49	0.04	110.28, 88.48	0.05
White Men (n = 27)	258.04, 221.51		179.93, 188.34	
Referent Gender				
Black Men (n = 9)	168.89, 78.65	0.12	109.44, 56.59	0.14
White Men (n = 25)	258.04, 221.51		179.93, 188.34	
Referent Race				
White Women (n = 28)	186.82, 96.40	0.06	130.07, 85.48	0.10
White Men (n = 27)	258.04, 221.51		179.93, 188.34	

Abbreviation: MMEs, morphine milligram equivalents.

We did not establish our CSSC with a health equity focus. Our registry demonstrated higher prescribed doses for White patients, consistent with other studies. Buonora et al found that Black, female patients ≥ 60 years old, were more likely to experience dose reductions over a 2-year period.¹⁵ In 2022, the CDC updated their Clinical Practice Guideline for Prescribing Opioids for Pain in United States. The updated guidelines no longer recommend upper limits for dosages but suggest cautious tapering of high dose opioid medications and provide strategies on how to appropriately discuss risks and benefits of opioid use with patients. The new guidelines acknowledge the potential harms of dose reductions including “untreated and undertreated pain, serious withdrawal symptoms, worsening pain outcomes, psychological distress, overdose, and suicidal ideation and behavior.”²³ These updated guidelines also call out the need for attention and action toward reducing disparities in untreated and undertreated pain among Black and Latinx patients. To our knowledge, our work is among the first to examine the effect of broad implementation the CDCs guidelines at the intersection of marginalized groups in primary care.²³

The strengths of the study include real-world longitudinal data on patients receiving chronic opioid pain treatment during a period when the CSSC was operational. Limitations include small samples of subgroups and limited categories for race, ethnicity, and gender and their intersectionality. We were unable to assess clinical appropriateness given insufficient data in the registry. We cannot exclude the possibility of confounding factors that might account for differences in baseline doses or dose reductions.

We did not observe statistically significant differences in relative dose reductions by race. However, our modest subgroup sample sizes may have precluded our detection of such a difference. Most importantly, we did not assess any patient-reported outcomes or patient-reported experience of care. Data suggest caution in tapering. In a retrospective cohort study, discontinuation of chronic opioid therapy for pain did not reduce risk of death, but rather was associated with increased risk of overdose death.²⁴ In a secondary analysis of a large Veterans Administration trial, the expansion of mandated case review of high-risk patients prescribed opioids for pain resulted in an increase in

all-cause mortality among patients recently diagnosed with opioid use disorder.²⁵ Given the challenges of identifying opioid use disorder among patients receiving opioids for chronic pain, cautious slow reduction dose reduction when indicated is prudent.^{26,27}

In this study, Black patients had lower doses to start and slightly higher rates of reduction. Our findings highlight the importance of addressing health equity early when implementing CSSCs. The inequities in baseline dosing rates require strategies for tapering chronic pain medications to be more nuanced and equity focused. General implementation of guidelines without special attention to certain patient populations can have unintended consequences and exacerbate disparities in pain control over time. Differences in initial dosing highlight an opportunity for primary care to lead the efforts of equitable CSSCs. We encourage future studies to examine our findings in the context of a larger sample size.

To see this article online, please go to: <http://jabfm.org/content/00/00/000.full>.

References

1. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016. *JAMA* 2016;315:1624–45.
2. Hulen E, Saha S, Morasco BJ, Zeigler C, Mackey K, Edwards ST. Sources of distress in primary care opioid management and the role of a controlled substance review group: a qualitative study. *Pain Medicine* 2018;19:1570–7.
3. Zeigler C, Mackey K, Hulen E, Carr T, Saha S, Edwards ST. Frontline account: reducing the stress of pain management through the implementation of a controlled substance review group in a VA internal medicine residency clinic. *J Gen Intern Med* 2017;32:832–5.
4. Seal K, Becker W, Tighe J, Li Y, Rife T. Managing chronic pain in primary care: it really does take a village. *J Gen Intern Med* 2017;32:931–4.
5. Awadallah N, Rollins V, Oung A, et al. An interprofessional approach to chronic pain management and education. *Fam Med* 2022;54:47–53.
6. Rambachan A, Fang MC, Prasad P, Iverson N. Racial and ethnic disparities in discharge opioid prescribing from a hospital medicine service. *Journal of Hospital Medicine* 2021;16:589–95.
7. Green CR, Anderson KO, Baker TA, et al. The unequal burden of pain: confronting racial and ethnic disparities in pain. *Pain Med* 2003;4:277–94.

8. Dickason RM, Chauhan V, Mor A, et al. Racial differences in opiate administration for pain relief at an academic emergency department. *WestJEM* 2015;16:372–80.
9. Hoffman KM, Trawalter S, Axt JR, Oliver MN. Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between Blacks and Whites. *Proc Natl Acad Sci USA* 2016;113:4296–301.
10. Lossio-Ventura JA, Song W, Sainlaire M, Dykes PC, Hernandez-Boussard T. Opioid2MME: standardizing opioid prescriptions to morphine milligram equivalents from electronic health records. *International Journal of Medical Informatics* 2022;162:104739.
11. Crenshaw KW. Mapping the margins: intersectionality, identity politics, and violence against women of color. *The public nature of private violence*. Routledge; 2013:93–118.
12. Jackson JW, Williams DR, VanderWeele TJ. Disparities at the intersection of marginalized groups. *Soc Psychiatry Psychiatr Epidemiol* 2016;51:1349–59.
13. Leece P, Buchman DZ, Hamilton M, et al. Improving opioid safety practices in primary care: protocol for the development and evaluation of a multifaceted, theory-informed pilot intervention for healthcare providers. *BMJ open* 2017;7:e013244.
14. Jordan M, Latif A, Mullan J, Chen TF. Opioid medicines management in primary care settings: a scoping review of quantitative studies of pharmacist activities. *Br J Clinical Pharma* 2021;87:4504–33.
15. Buonora M, Perez HR, Heo M, Cunningham CO, Starrels JL. Race and gender are associated with opioid dose reduction among patients on chronic opioid therapy. *Pain Medicine* 2019;20:1519–27.
16. Bauer SR, Hitchner L, Harrison H, Gerstenberger J, Steiger S. Predictors of higher-risk chronic opioid prescriptions in an academic primary care setting. *Substance Abuse* 2016;37:110–7.
17. Morasco BJ, Duckart JP, Carr TP, Deyo RA, Dobscha SK. Clinical characteristics of veterans prescribed high doses of opioid medications for chronic non-cancer pain. *PAIN* 2010;151:625–32.
18. Haq N, McMahan VM, Torres A, et al. Race, pain, and opioids among patients with chronic pain in a safety-net health system. *Drug and Alcohol Dependence* 2021;222:108671.
19. Pisanu C, Franconi F, Gessa GL, et al. Sex differences in the response to opioids for pain relief: a systematic review and meta-analysis. *Pharmacological Research* 2019;148:104447.
20. Sharp JL, Pearson T, Smith MA. Sex differences in opioid receptor mediated effects: role of androgens. *Neurosci Biobehav Rev* 2022;134:104522.
21. Huhn AS, Berry MS, Dunn KE. Systematic review of sex-based differences in opioid-based effects. *International Review of Psychiatry* 2018;30:107–16.
22. Alabas O, Tashani O, Tabasam G, Johnson M. Gender role affects experimental pain responses: a systematic review with meta-analysis. *European Journal of Pain* 2012;16:1211–23.
23. Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R. CDC clinical practice guideline for prescribing opioids for pain—United States, 2022. *MMWR Recomm Rep* 2022;71:1–95.
24. James JR, Scott JM, Klein JW, et al. Mortality after discontinuation of primary care-based chronic opioid therapy for pain: a retrospective cohort study. *J Gen Intern Med* 2019;34:2749–55.
25. Auty SG, Barr KD, Frakt AB, Garrido MM, Strombotne KL. Effect of a Veterans Health Administration mandate to case review patients with opioid prescriptions on mortality among patients with opioid use disorder: a secondary analysis of the STORM randomized control trial. *Addiction* 2023;118(5):870–879.
26. Manhapra A, Sullivan MD, Ballantyne JC, MacLean RR, Becker WC. Complex persistent opioid dependence with long-term opioids: a gray area that needs definition, better understanding, treatment guidance, and policy changes. *J Gen Intern Med* 2020;35:964–71.
27. Hasin DS, Shmulewitz D, Stohl M, et al. Diagnosing prescription opioid use disorder in patients using prescribed opioids for chronic pain. *AJP* 2022;179:715–25.